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ARI Research Note 91-18

# Interim Final Report: Developing Training and Systems Solutions for Combat-Critical Tasks

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January 1991



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United States Army  
Research Institute for the Behavioral and Social Sciences

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Research accomplished under contract  
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Litton Computer Services

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# REPORT DOCUMENTATION PAGE

Form Approved  
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified			1b. RESTRICTIVE MARKINGS ---		
2a. SECURITY CLASSIFICATION AUTHORITY ---			3. DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.		
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE ---					
4. PERFORMING ORGANIZATION REPORT NUMBER(S) ---			5. MONITORING ORGANIZATION REPORT NUMBER(S) ARI Research Note 91-18		
6a. NAME OF PERFORMING ORGANIZATION Litton Computer Services		6b. OFFICE SYMBOL (If applicable) ---		7a. NAME OF MONITORING ORGANIZATION U.S. Army Research Institute for the Behavioral and Social Sciences	
6c. ADDRESS (City, State, and ZIP Code) 1300 Villa Street Mountain View, CA 94041			7b. ADDRESS (City, State, and ZIP Code) P.O. Box 2086 Fort Benning, GA 31905		
8a. NAME OF FUNDING / SPONSORING ORGANIZATION U.S. Army Research Institute for the Behavioral and Social Sciences		8b. OFFICE SYMBOL (If applicable) PERI-I		9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER MDA903-88-C-0407	
8c. ADDRESS (City, State, and ZIP Code) 5001 Eisenhower Avenue Alexandria, VA 22333-5600			10. SOURCE OF FUNDING NUMBERS		
PROGRAM ELEMENT NO. 63007A		PROJECT NO. 795		TASK NO. 3306	
				WORK UNIT ACCESSION NO. C3	
11. TITLE (Include Security Classification) Interim Final Report: Developing Training and Systems Solutions for Combat-Critical Tasks					
12. PERSONAL AUTHOR(S) Osborne, Art; Mullenix, Louise S.					
13a. TYPE OF REPORT Final		13b. TIME COVERED From 90/04 TO 90/09		14. DATE OF REPORT (Year, Month, Day) 1991, January	
15. PAGE COUNT 6					
16. SUPPLEMENTARY NOTATION Seward Smith, Contracting Officer's Representative					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	Basic rifle marksmanship		
05	06		Moving target training		
19	06		Weapon training devices		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) This interim final contract report summarizes the operational support provided by Litton Computer Services to the U.S. Army Research Institute for the Behavioral and Social Sciences, Fort Benning Field Unit, Fort Benning, Georgia, from April 1990 through September 1990. The area addressed was Multipurpose Arcade Combat Simulator (MACS) implementation, maintenance, and fielding. The results of this effort are contained in an updated Moving Target Program, Trainers' Guide, and other products.					
20. DISTRIBUTION / AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION Unclassified		
22a. NAME OF RESPONSIBLE INDIVIDUAL Seward Smith			22b. TELEPHONE (Include Area Code) (404) 545-5589		22c. OFFICE SYMBOL PERI-IJ

INTERIM FINAL REPORT: DEVELOPING TRAINING AND SYSTEMS SOLUTIONS  
FOR COMBAT-CRITICAL TASKS

CONTENTS

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	Page
SUMMARY. . . . .	1



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DTIC TAB	<input type="checkbox"/>
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Justification	
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Dist	Avail and/or Special
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Interim Final Report: Developing Training and Systems Solutions For  
Combat-Critical Tasks

This interim final contract report summarizes the operational support provided by Litton Computer Services (Litton) to the U.S. Army Research Institute (ARI) for the Behavioral and Social Sciences, Fort Benning Field Unit, Fort Benning, Georgia during the period 18 April 1990 through 14 September 1990 under contract MDA 903-88-C-0407, modification 9. The March 1990 interim final contract report covered research completed during the period 28 January 1988 through 30 March 1990: The results of this effort are contained in 45 reports and products submitted to ARI on 30 March 1990.

During this 5 month period, the sole area of concentration addressed was Subtask 4: MACS Implementation, under TASK 03: Weapon Systems Training. Prioritized effort continued on the implementation, maintenance, and fielding of the Multipurpose Arcade Combat Simulator (MACS) with funding provided by Training and Doctrine Command (TRADOC).

This is a five-year contract, beginning 28 January 1988, with a total value of \$8,723,791; however, ARI provided reduced funding for FY 88 and FY 89 (a total of \$3,198,400) **and, at the beginning of the** second contract year, a decision was made to provide no ARI funding for FY 90 and beyond. ARI funding was expended on 30 March 1990 and TASK 01: Training and Tactical Doctrine Development for Light Infantry Readiness and TASK 02: Land Navigation Training were therefore closed out. (TASK 04: Bradley Fighting Research was not funded at all.) All contract tasks will remain in an open but unfunded state, however, in the event additional funding does become available from ARI or from other sources such as TRADOC.

The **In-Process** Review (IPR) was conducted on 13 July 1990 for the Multipurpose Arcade Combat Simulator (MACS), in accordance with modification 9 of the subject contract. Agreements resulting from discussions on the MACS implementation effort, beginning with the Initial Planning Meeting on 24 April 1990 and continuing through the IPR to end of contract period, covered six areas of concentration, with work specified to be in a state of completion on or before 14 September 1990.

- (1) The Commodore Basic Rifle Marksmanship (BRM) Program has proven to be very successful. Field use and evaluation of the current BRM Program indicated no need to modify the existing program. During this contract period, Litton continued to provide support to the United States Army Infantry School (USAIS), the Training Support Center (TSC), and the 29th Infantry Regiment in the operation and fielding of the MACS Systems.

- (2) Based upon input from the field and further in-house evaluation, improvements were made to the MS-DOS Basic Rifle Marksmanship Program. We recommend that this enhanced new software be fielded with the MS-DOS MACS Systems.
- (3) The Commodore Moving Target Program was modified, updated, and evaluated in-house. The prototype was used by the 29th Infantry Regiment in a marksmanship field test for one station unit training (OSUT) soldiers beginning on 12 July 1990 with favorable results. The instructional material and graphics to support this program were added to the MACS Trainer's Guide. The commanding general of TRADOC was briefed on the results of the field test and has directed that another test be conducted in the future using the MACS Moving Target Program as a training device during the test. The program received positive comments and feedback from both instructors and subject matter experts. The final Moving Target Trainer's Guide with software was provided to ARI on 14 September 1990.
- (4) The software and accompanying documentation supporting the partially complete MS-DOS Moving Target Program were submitted to the Army Research Institute on 14 September 1990. While laying a good foundation for more in-depth work, the Litton effort nevertheless was constrained by limited resources of time and staff. Additional funding for and continued effort on the MS-DOS Moving Target Program are necessary if several technical problems are to be solved and a program developed suitable to meet the requirements of the field.
- (5) The MACS Night Fire Program followed the above in priority of effort, resulting in no work accomplished on the program; however, we continued to explore promising ideas for refining the model AN/PVS-4 scope. The scope was determined to be unsuitable for use in its current state, due primarily to excessive parallax. A paper was developed which included the modifications needed to make the model scope an effective MACS training device, allowing for use on the existing MACS program.
- (6) The Trigger Switch for the Actual Weapon was returned to Litton by the Georgia Tech Research Institute (GTRI) following modifications toward functional improvement. The unique advantage of the trigger switch is that it allows a soldier to install the device quickly in his own weapon and experience the actual trigger pull of his assigned rifle during MACS training. This is possible because the device cocks the rifle each time it is fired by pushing the hammer

back into the cocked position. We conducted pilot testing with the device in a fully operational mode with an actual rifle. While we have demonstrated proof-of-concept, this should be treated as a first prototype which is not yet ready for general field use.

The Light Pen Mount was tested during the evaluation of the trigger switch. It works. It is easy to attach, and it holds the light pen rigid during normal firing. However, it is not compatible with all light pens in use and should be treated as a first prototype.

The Combined Light Pen/Sound Board to enhance MS-DOS MACS Programs was assembled by GTRI. The sound of an M-16 firing was recorded on the board, and it was fully integrated with an operational MACS system. This test serves only as proof-of-principle, using a hand-wired board. This combined board has the potential to enhance MS-DOS MACS, and it may be able to work equally well on EGA and VGA PC systems.

Feedback from the field obtained from the ongoing marksmanship test, using the BRM and Moving Target MACS Programs, as well as feedback from other field evaluations, resulted in highlighting the need for fielding of additional MACS systems and software for the Moving Target Program. In Germany, the lack of adequate and accessible range facilities and the restricted training time increasingly require the liberal use of low-cost, user-friendly training devices. The Multipurpose Arcade Combat Simulator has proven to be highly successful in meeting this critical need.

Continued work on MACS and consistent support to the field on this innovative training tool is imperative. The current crisis in the Middle East heightens awareness that a soldier's ability to defend himself and to engage targets accurately is a ceaseless concern of military leaders. The accompanying escalating costs of underwriting warfare indicate a continuing and ever increasing demand to provide soldiers with effective but affordable training. In the face of this obvious and present need, we should not discard or postpone support for the continued fielding of pertinent rifle marksmanship training systems such as the Multipurpose Arcade Combat Simulator. As additional funds become available and are restored, Litton Computer Services will continue to provide the Army the expertise and talent necessary to meet the demands and needs of the contemporary soldier and to support American fighting troops worldwide.